SPECTROSCOPIA MOLECULAR

UN PERIODICO DE NOVAS E INFORMATIONES DE INTERESSE E VALOR AL SPECTROSCOPISTAS

Publicate in interlingua per Forrest F. Cleveland, Professor de Physica, Instituto Technologic de Illinois, Chicago 16. Consiliero linguistic, Dr. A. Gode, Division de Interlingua, Science Service, 80 East 11th St., New York 3. 12 numeros per anno, $2.25. Le periodico depende de receptas financiari ab illes qui beneficia de illo.

CALCULATION DE CONSTANTES DE FORTIA PER USO DE UN COMPUTATOR DIGITAL

UN ALGORITHMO pro le calculation systematic del constantes in le function de energia potential Urey-Bradley ha essite programmate pro un computator digital (le Datatron 204) per J. Overend e J. R. Scherer del Compania Dow Chemical a Midland in Michigan. Le equation secular es formate e solvite in le coordinatas interne, le energia potential essente transformate ex le spatio Urey-Bradley al spatio del coordinatas interne per un matrice Z. Le mesme matrice etiam es usate pro transformar le function Jacobiari de λ, con respecto al constantes de fortia in le spatio del coordinatas interne, al spatio Urey-Bradley, assi facente possibile le determination directe del constantes de fortia in le function Urey-Bradley.

Illes ha disveloppate un methodo per le qual le matrice Z e le matrice Wilson pote esser formate per le computator ex le parametros geometric del molecula.

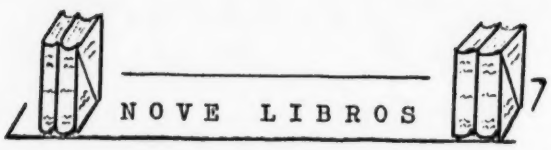
Drs. Overend e Scherer prefere le function Urey-Bradley proque con isto solmente un parve numero de parametros es necessari pro un complete description del energia potential. Etiam, le function contine explicitemente nulle terminos quadratic non-diagonal proque istos es implicite in le interactiones inter le atomos non-ligate. Iste interactiones frequentemente es plus facilemente visualisabile que le terminos quadratic non-diagonal e assi debe esser plus facile a correlatar, specialmente pro grande moleculas con multe grados de libertate vibrational. Le calculationes de Shimanouchi e al. ha demonstrate le validitate de iste function e ha establite valores typic pro multes del constantes in le function del energia potential.

Iste informationes es extrahite ex un manuscripto prepublicatori recipite le 8 de octobre. Plus detalios va esser publicate in le Journal of Chemical Physics. 6

GEMMA DE SAGESSA

QUE ES un grande dilection de libros? Illo es simile a un introduction personal al homines grande e bon de omne le tempores passate. Libros, il es ver, es silente quando on vide los super lor plancas; sed, silente como illos es, quando io entra in un bibliotheca io me senti quasi como si le mortos esseva presente, e io sape que si io pone questiones a iste libros illos respondera a me.

— JOHN BRIGHT.



• Methods of Experimental Physics. Vol. 6. Solid State Physics, Part A: Preparation, Structure, Mechanical and Thermal Properties (Methodos del Physica Experimental. Vol. 6. Physica del Stato Solide, Parte A: Preparation, Structura, Proprietates Mechanic e Thermal). K. LARK-HOROVITZ e V. A. JOHNSON, Redactores. 34 autores. Academic Press, 111 Fifth Ave., New York 3; 40 Pall Mall, London S. W.1; 1959. 466 ps. 15 x 23 cm. $11.80.

UN PRESENTATION concise e ben-illustrate del methodos e principios usate in le physica experimental del stato solide. Illo es intendite pro le studente avantiate, le instructor, e le recercator. Themas tractate es le preparation e purification de materias, le determination de structuras de crystallos, le proprietates mechanic e thermal, e le studios del stato solide a alte pressiones.

• Methods of Experimental Physics. Vol. 6. Solid State Physics, Part B: Electrical, Magnetic, and Optical Properties (Methodos del Physica Experimental. Vol. 6. Physica del Stato Solide, Parte B: Proprietates Electric, Magnetic, e Optic.) K. LARK-HOROVITZ e V. JOHNSON, Redactores. 36 autores. Academic Press, supra-date adresses: 1959. 416 ps. 15 x 23 cm. $11.00.

TRACTATE ES le proprietates electric, magnetic, e optic; le effectos galvanomagnetic e thermomagnetic; le luminescentia; e le phenomenos photoelectric.

• Solid State Physics. Vol. 9. Advances in Research and Applications (Physica del Stato Solide. Vol. 9. Avantiamentos in le Recercas e le Applicationes). F. SEITZ e D. TURNBULL, Redactores. Nove autores. Academic Press, supra-date adresses: 1959. 548 ps. 15 x 23 cm. $14.50.

LE SPECTROS electronic es tractate in duo del capitulos. In un, D. S. McClure presenta le Parte II de su serie super le spectros de ions in crystallos, le qual es intitulate "Spectros Electronic de Moleculas e Ions in Crystallos". In le altere, H. C. Wolf discute le spectros electronic de crystallos molecular aromatic.

Altere capitulos tracta del semiconductores polar, electrification static de solidos, interdependentia del physica del stato solide e le distribution angular de radiones nucleari, comportamento oscillatori del susceptibilitate magnetic e le conductivitate electronic, e del heterogeneitates in solutiones solide.

Un lista de articulos planate pro volumines futur es includite. Inter istos, 4 es de interesse a spectroscopistas:

1) Spectros infrarubie producite per atomos estranie in semiconductores. E. BURSTEIN e G. PICUS.

2) Infrarubio e proprietates affin de crystallos. E. BURSTEIN e M. LAX.

3) Theoria de gruppos e le spectros electronic de solidos. C. M. HERZFELD.

4) Accopulamento de orbitas e spins in solidos. Y. YAFET.

• Introduction to Quantum Mechanics (Introduction al Mechanica Quantic). C. W. SHERWIN, Henry Holt and Company, 383 Madison Ave., New York 17: 1959. 385 ps. 16 x 23 cm. $7.50.

UN TEXTO pro un prime curso in le mechanica quantic pro studentes intermediate. Problemas 1-dimensional es tractate frequentemente pro simplicitate. Le theoria exacte es applicate a problemas simple in loco de un application de un theoria approximative a problemas complexe. Nulle fundation es assumite ultra equationes differential e le physica general. Le emphase es super le uso del theoria. δ

COLLOQUIUM SPECTROSCOPICUM INTERNATIONALE

LE COMMUNICATIONES scientific origional presentate al octave Colloquium Spectroscopicum Internationale ab le 14 al 18 de septembre 1959 a Lucerne in Switza va esser publicate durante le sequente primavera como un supplemento al periodico switze, Chimia.

Le volumine continera articulos in anglese, francese, o germano super le spectroscopia emissionic, massic, o fluorescentic a radios X.

Isto pote esser obtenite ab Albert J. Phiebig, P. O. Box 352, White Plains, New York, S.U.A., a un precio de $19.50. ô

CELEBRATION BUNSEN-KIRCHHOFF

UN CELEBRATION del Centenario del Discoperta del Spectroscopia Applicate per Bunsen e Kirchhoff va esser tenite in april in Heidelberg.

Pro plus informationes, scribe a G. Scheibe, Marsbruckstrasse 186, Dortmund-Atlerbeck, Germania.

Un calendario de altere eventos spectroscopic esseva date in Spec. Mol. 8 (1959) 66, novembre. ô

UN MICROSPECTROPHOTOMETRO SIMPLIFICATE

UN MICROSPECTROPHOTOMETRO con componentes electronic ha essite construite in le laboratorio de Drs. G. K. Strother e J. J. Wolken (Laboratorio de Recerca Biophysic, Hospital de Oculo e Aure, Schola de Medicina del Universitate Pittsburgh, Pittsburgh, Pa., S.U.A.). Isto es usate pro investigar structuras pigmentari in cellulas vivente.

Le elemento que es sensibile al lumine es un cella photoconductive de selenido de cadmium. Le voltage producite per le photocella es amplificate per un amplificator de currente directe continente transistores e le voltage si augmentate es monstrate super un oscilloscopo usate como un voltmetro de currente directe.

Cellas photoconductive ha essite usate pro multe annos pro mesurationes spectral in le infrarubio e plus recentemente etiam in le spectroscopia de radios X. Sed isto es le prime vice que iste cellas ha essite usate in le visibile e le ultraviolet-ta.

Un photographia e diagramma del apparatos si ben como plure curvas de absorption e 16 referentias es date in Science 130 (1959) 1084-88.

Le presente adresse de Dr. Strother es: Departimento de Physica, Universitate Statal Pennsylvania, Parco Universitari, Penna., S. U. A. ô

SUBVENTIONES POSTDOCTORAL

PLURE SUBVENTIONES postdoctoral es disponibile al Consilio National de Recerca a Ottawa in Canada. Le salario annue es $3700 si non maritate, $4500 si maritate. Isto es libere de taxas governamental.

Applicantes debe esser non plus que 35 annos de etate e debe haber le grado Dr. phil. ab un universitate recognoscite. Il ha nulle restrictiones in re le nationalitates del applicantes.

Le subventiones es pro un anno, sed applicationes pro un secunde anno essera considerate. Illes comencia normalmente in september o october, sed iste tempore de comenciamento non es inflexibile. Un subvention additional pro le costos de viage essera facite.

Formularios de application pote esser obtenite ab le: Awards Officer , National Research Council, Ottawa 2, Canada.

Iste subventiones es de interesse special a spectroscopistas a causa del opportunitates excellente pro recerca in le laboratorios de Drs. Herzberg e Bernstein in le divisiones de physica e chimia pur. ô

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SPECTROS MOLECULAR. II. Tractamentos del Coordinatas Normal de Moleculas Polyatomic. A. Theoria General. Per Salvador M. Ferigle e Alfons Weber. Publicate per Forrest F. Cleveland, c/o Laboratorio de Spectroscopia, Instituto Technologic de Illinois, Chicago 16, Illinois, Statos Unite; 1955. 27 + v paginas. Costo, $1.00 si pagamento accompania le requesta; si non, $1.25.

ISTE PARVE MONOGRAPHIA explica le theoria general in re tractamentos del coordinatas normal de moleculas polyatomic. Le formulas es derivate e tunc applicate al moleculas XY_2 linear e non-linear, e CX_3Y tetrahedric. Le conditiones Eckart es discute, tanto como le uso del symmetria del molecula pro simplificar le problema.

Pro plus facile comprehension per le plus grande numero de spectroscopistas, illo es scribite in Interlingua, le lingua international. Illo es appropriate pro uso in seminarios, classes in structura molecular, o pro referentia. Illo etiam pote esser usate per le lector individual qui desira comprehender iste subjecto. Le tractamento es elementari e detaliate pro plus facile comprehension per le initiato in iste campo.

* * *

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* * *

(Seca e posta al Laboratorio de Spectroscopia, Instituto Technologic de Illinois, Chicago 16, Illinois, Statos Unite. Costo $1.00 nette, franc de posta, per cata un, si pagamento es includite. Per favor, face cheques pagabile a "Spectroscopia Molecular".)

1) Io include $_____ pro _____ exemplares de SPECTROS MOLECULAR. II. TRACTAMENTOS DEL COORDINATAS NORMAL DE MOLECULAS POLYATOMIC.

2) Etiam includite es $_____ pro _____ exemplares de SPECTROS MOLECULAR. I. REGULAS DE SELECTION PRO SPECTROS VIBRATIONAL DE MOLECULAS POLYATOMIC. (le precio de isto es $0.75 nette per cata un.)

Nomine e adresse:

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ESTABLISHED 1933

Karl Lambrecht

MANUFACTURERS OF CRYSTAL OPTICS

4318 N. LINCOLN AVENUE - CHICAGO 18, ILLINOIS - U. S. A. - TELEPHONE: IRVING 8 - 0843

MODIFICATION OF POLARIZING MICROSCOPES AND ALL POLARIZING INSTRUMENTS EMPLOYING SYNTHETIC SHEET POLARIZERS.

In recent years due to the scarcity of calcite (also known as Iceland Spar), many polarizing microscopes have been manufactured employing synthetic polarizers. The advantages of polarizing prisms of calcite offering complete polarization (complete extinction) for all wave lengths transmitted are lost to the research worker attempting to investigate in a precision manner. Recently, however, large deposits of optical quality calcite have been discovered which make possible the production of high quality calcite prisms.

In the light of this availability, Karl Lambrecht is offering at reasonable cost the modification of polarizing microscopes to employ polarizing prisms. Enclosed is a photograph of a polarizing prism.

We have also available a limited amount of sensitive (first order red) wave plates. The sensitivity of such wave plates greatly exceeds that of synthetic materials. Mica wave plates are available in quarter wave retardations.

We are currently manufacturing the following polarizing instruments:

1. Babinet Compensator
2. Babinet Solid Compensator
3. Martins Photometer

A University of Rochester scientist says a new type of microscope is helping unlock some of the secrets of muscles.

Dr. Shinya Inoue says biochemists have discovered that the bands which make up muscle fibers "Migrate, change dimensions and merge reversibly during muscle contraction."

Dr. Inoue makes the disclosure in a paper prepared for a meeting of the Biophysical Society at the Massachusetts

SUBSEQUENT TO THE PRINTING OF THE ATTACHED CIRCULAR, ADDITIONAL INFORMATION HAS BEEN OBTAINED.

Among other applications, precision calcite prisms made by Karl Lambrecht have been used for the universal polarizing microscope made jointly by American Optical Company and Dr. Shinya Inoué, a University of Rochester scientist.

With this instrument it was discovered that the bands which make up muscle fibers "migrate, change dimensions and merge reversibly during muscle contraction."

Dr. Inoué makes the disclosure in a paper presented at a meeting of the Biophysical Society at the Massachusetts Institute of Technology, at Cambridge, Massachusetts.

He said the microscope is 20 times more sensitive than previous instruments and detects phase differences of four-tenths of one-billionth of an inch or one-tenth of an angstrom. This measurement can be made on objects only two-tenths of a micron wide.

Polarizing prisms go down to 2000 angstroms or less ultraviolet and 2.3 microns infrared. Twenty millimeter and larger polarizing prisms can now be produced which will transmit intensities of less than one part in a million in crossed orientation. This is an example of the extensive research and development that Karl Lambrecht has done.

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**MOUNTED
RISM IN
VIDED CIRCLE**

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Dr. Shinya Inoue says biochemists have discovered that the bands which make up muscle fibers "Migrate, change dimensions and merge reversibly during muscle contraction."

Dr. Inoue makes the disclosure in a paper prepared for a meeting of the Biophysical Society at the Massachusetts Institute of Technology, at Cambridge, Massachusetts.

He said the observations were made through a microscope 20 times more sensitive than previous instruments and detect phase differences of one one-billionth of an inch or 3/10 of an angstrom. Polarizing prisms go down to 2000 or less ultra violet and 2.3 microns infrared. It was built by him and the American Optical Company using Lambrecht polarizing prisms.

Polarizing prisms can now be produced which will transmit intensities of less than one part in a million in crossed orientation. This is an example of the extensive research and development that Karl Lambrecht has done.

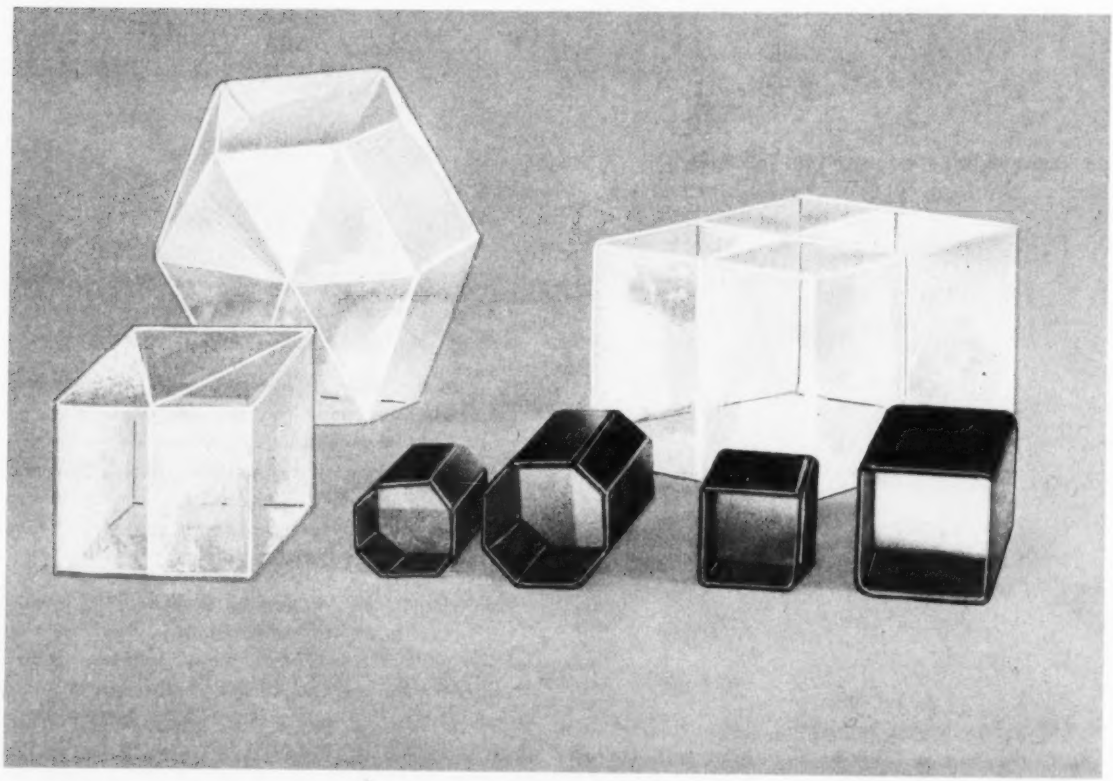
Specializing in manufacturing lenses, prisms and plates made of:
CALCITE - FLOURITE - GLASS - QUARTZ - ROCKSALT - SYNTHETIC CRYSTALS - CYLINDRICAL LENSES

Special Optics:
POLARIZING PRISMS - PARABOLIC and ELLIPTICAL MIRRORS - SCHMIDT CAMERA PLATES

The Story of Lambrecht Prisms

CALCITE MINING AND CLASSIFICATION

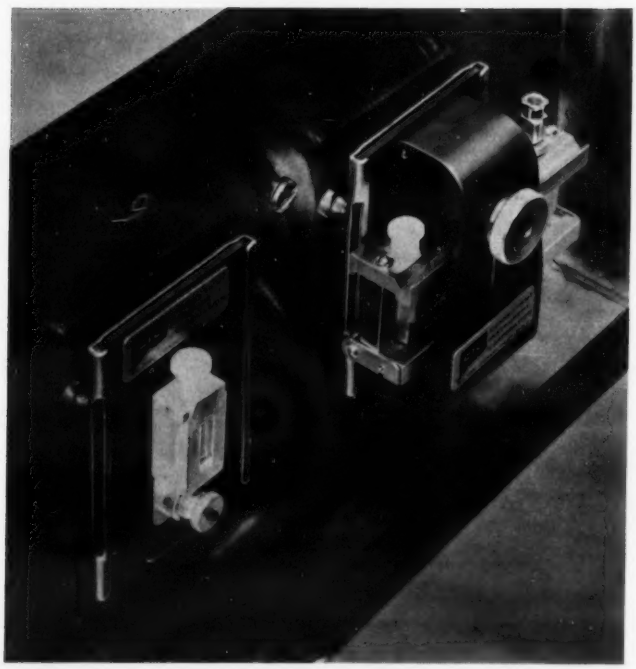
COMPLETED PRISMS



Wedge-Cavity Cell

CIC

DATA SHEET



The C.I.C. Wedge-Cavity Cell is a simple, rugged variable pathlength absorption cell designed for solvent compensation. In addition, because it is extremely easy to clean, it may also be used directly as a sample cell. Unlike conventional variable space cells, the method of construction of the wedge cell is so simple that there is little to go wrong even under the hardest of usage.

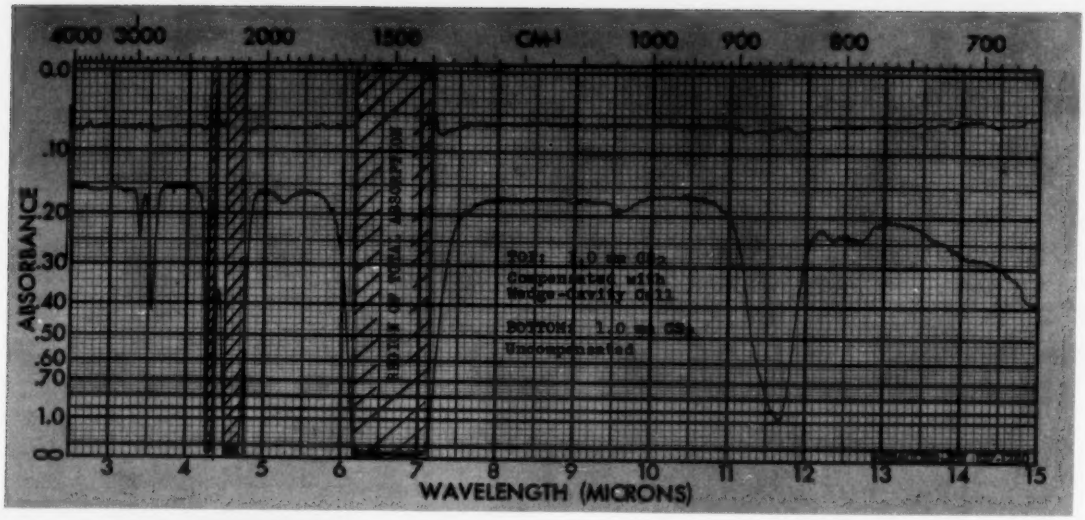
Description.

The Wedge-Cavity Cell is constructed as follows: A cavity is machined in a single block of salt deep enough to intercept the spectrometer beam and varying linearly in width from one end to the other. The block is mounted in a carriage which in turn is mounted on nylon rollers so that it may be moved transversely in the beam by means of a control knob. A Teflon gasket between the top of the salt block and the carriage serves to seal the top of the wedge. Filling and emptying is accomplished by means of a hypodermic needle soldered into the carriage and extending down into the cavity. A second port provides an air vent or an outlet when solvent is flushed through the cell. The cell is not intended for precision measurement of pathlength so a scale is not provided.

Applications.

The most general use of the Wedge-Cavity Cell is in solvent compensation work. Matched cells are difficult to keep matched and become ineffective if solute concentrations are appreciable.

To compensate for solvent absorption, a wedge cell is filled with solvent and placed in the reference beam. The solvent — plus sample is placed in the sample beam in a conventional Cavity Cell (or other type of cell). The spectrometer is set at a solvent absorption



band (preferably one which has about 50% absorbance). The Wedge-Cell is adjusted until the band disappears. Under these conditions all other solvent bands (except those which are completely absorbing) will be nearly completely eliminated.

Another very practical application for the Wedge-Cavity Cell is as a sample cell — it may be filled with sample and adjusted in the sample beam so that the absorption bands of the sample have just the right absorbance at each spectral region. Since the cell may be easily flushed out or quickly disassembled for cleaning, there is little danger in contaminating the cell with sample.

Specifications of Wedge-Cavity Cell

Wedge Blocks:

- #W-1 For use with 0.1, 0.2 and 0.5 mm cells.
- #W-2 For use with 1, 2 and 3 mm cells.

Cell Mount: Fits all Perkin-Elmer spectrophotometers and Beckman IR-4, 5, 6 and 7 instruments.

Prices:

CH-5 Wedge Cell Mount	$50.00
W-1 NaCl Block	75.00
W-2 NaCl Block	75.00

Note:

When ordering, please indicate the block number required.

CIC

Connecticut Instrument Corporation

Wilton, Connecticut, U.S.A.

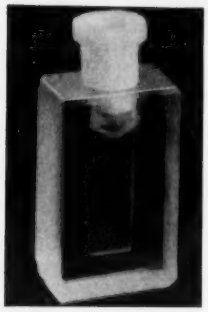
Telephone POrter 2-5545

CAVITY CELLS

CIC

DATA SHEET

TYPE "B" MACRO CELL Specifications

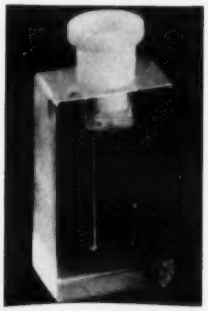


For: All Perkin-Elmer Infrared Spectrophotometers.
(Will give approximately 70% transmission in Beckman IR-4, 5 and 7.)
Thicknesses (Nominal): 1.0, 2.0 and 3.0 mm.
Sample Area: 4.5 x 15 mm.
Volume (1.0 mm thickness): .070 milliliters.
Cell Size: 10 x 15 x 25 mm.
Use with cell holder CH-1.

Materials and Prices

NaCl	$20.00
KBr	30.00
CaF_2	75.00
BaF_2	$100.00
CsBr	125.00
Fused Quartz	40.00

TYPE "C" SHORT PATHLENGTH CELL Specifications



For: All Perkin-Elmer Infrared Spectrophotometers.
(Will give approximately 70% transmission in Beckman IR-4, 5 and 7.)
Thicknesses (Nominal): 0.1, 0.2 and 0.5 mm.
Sample Area: 4.5 x 15 mm.
Volume (0.1 mm thickness): .020 milliliters.
Size: 10 x 15 x 25 mm.
Use with cell holder CH-1.

Materials and Prices

NaCl	$20.00
KBr	30.00
CaF_2	75.00
BaF_2	$100.00
CsBr	125.00
Fused Quartz	40.00

TYPE "E" LONG PATHLENGTH CELL Specifications

For: All Perkin-Elmer Infrared Spectrophotometers.
(Will give approximately 70% transmission in Beckman IR-4, 5 and 7.)

Thicknesses (Nominal): 4.0 and 5.0 mm.

Sample Area: 4.5 x 15 mm.

Volume (5 mm cell): .34 milliliters.

Cell Size: 25 x 15 x 15 mm.

Use with cell holder CH-1.

Materials and Prices

NaCl	$20.00
KBr	30.00
CaF_2	90.00
BaF_2	$120.00
CsBr	145.00
Fused Quartz	40.00

COMPENSATION PLATES

Available for use with Cavity Cells (and other types of absorption cells, for that matter) are a series of compensation plates approximately the same size and thickness as the Cavity Cells. These are useful in double beam instruments to balance out losses due to cell windows. The compensation plates are designed to fit in Cavity Cell Holder CH-1 and are 10 x 15 x 25 mm in size.

Prices and materials are as follows:

NaCl	$10.00	BaF_2	$ 70.00
KBr	15.00	C_2Br	100.00
CaF_2	35.00	Fused Quartz	15.00

CELL HOLDER

CH-1

For Types "B", "C" and "E" Cavity Cells. Usable in all Perkin-Elmer spectrometers and Beckman models IR-4, 5 and 7 spectrometers ..... $15.00 each

CIC
Connecticut Instrument Corporation
Wilton, Connecticut, U.S.A.
Telephone POrter 2-5545